FUJITSU

Data Sheet
1FINITY L100 Lambda Blade

Scalable ROADM-on-a-blade for agile optical networking

1FINITY™ L100 Blade at a Glance

- Twin 1 × 9 WSS ROADM
- Fixed and flex C-band (L-band variant planned)
- Add L100 blades in-service on per-degree basis
- Optimized for 100G and above wavelengths

Product Overview

The L100 is a DWDM ROADM-on-a-blade system that provides wavelength multiplexing, amplification and switching in a stackable, compact form factor for metro and regional networks. The blade has nine client ports, one fixed line port, and a built-in universal amplifier. A pluggable optical supervisory channel (OSC) provides options for interoperation, metro or longer reach. Management ports enable SDN control and connect node blades together. Fujitsu-specific application interfaces (APIs) are supported, in addition to open APIs.

Supported Solutions and Applications

Fujitsu applications and solutions supported by the L100 blade incorporate certified and tested performance characteristics, SDN provisioning and management, and optical design tool functions.

The L100 can be deployed in either new or existing optical networks by pairing it with the L110 and L120 blades to create various ROADM node configurations.

In "greenfield" scenarios, this type of photonic layer node can connect to 1FINITY Transport blades to create a flexible, scalable network that safeguards future growth. In "brownfield" scenarios, a 1FINITY L100 series ROADM node can be added as a spur on a FLASHWAVE 9500® Packet Optical Networking Platform to create a hybrid 10G/100G DWDM network that extends the life of the existing equipment assets and protects capital investment.

The L100 is approved for deployment under the Open ROADM MSA, an agreement that defines interoperability specifications, to enable optical layer flexibility and software control

1FINITY L100 Series Overview

The 1FINITY L100 Series, Fujitsu's disaggregated optical layer, provides flexible ROADM functionality that easily accommodates rapid bandwidth growth. The series features compact, 1RU globally compliant enclosures and a functionally modular design. These blades provide the building blocks for an open, simple, scalable physical ROADM architecture.

Blades in the Series

The series currently consists of three types of blades:

- **The L100** – A twin 1 × 9 wavelength selectable switch (WSS) ROADM-on-a-blade
- **The L110** – An optical muxponder base blade with slots for add/drop plug-in units
- **The L120** – An expansion WSS for nodes beyond four degrees

L100 series blades can be deployed in combination with other 1FINITY blades, including the L200 Inline Amplifier and L300 2-degree ROADM, in addition to blades in the Switch and Transport Series.

Equipped to handle any provider's SLA requirements, L100 blades incorporate dual-feed, fixed DC power supplies and robust, field-replaceable fans. Blades are compatible with various physical installation environments, including 19″ or 23″ standard racks (two- or four-post), as well as the 1FINITY Housing.

CD-ROADM Nodes up to Four Degrees

ROADM Configurations

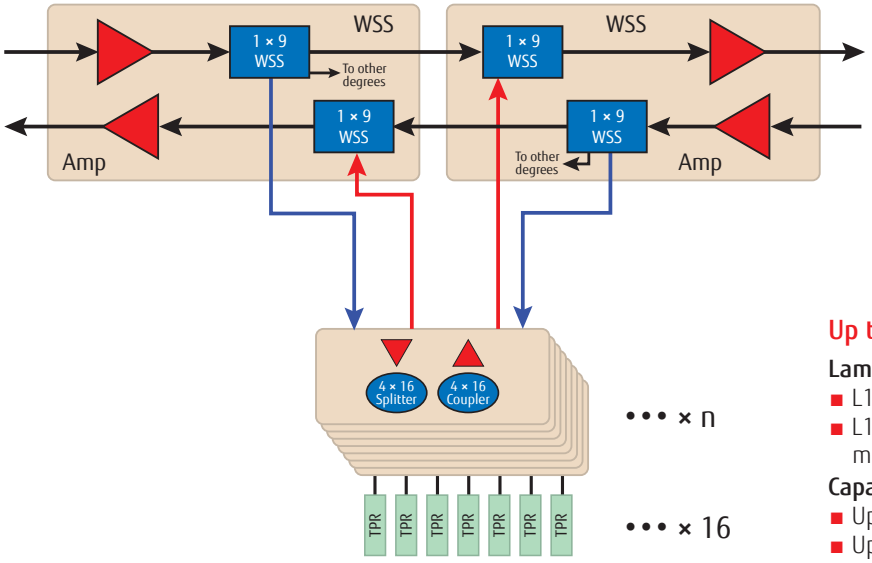
Small ROADM configurations using the 1FINITY L100 series provide up to four degrees of ROADM support with integrated management. One L100 blade is deployed for each degree. The L100 is paired with the L110 Optical Channel Management Blade to create a small ROADM node. The L110 connects colorless and directionless channels into the node. Larger ROADM configurations use the L120 expansion WSS blade, including eight-degree optical hubs.

Up to ten L100 series blades (one main blade and up to nine tributary blades) can be interconnected as single NE, or the blades can be connected to the 1FINITY C Series Communications Integrator. Each blade provides sufficient management ports for blade interconnections. Blades configured as a single NE may be separated up to 1 dB, enabling construction of NEs using any available space within a central office or data center. Internal Rapid Spanning Tree Protocol (RSTP) ensures multi-blade protection.

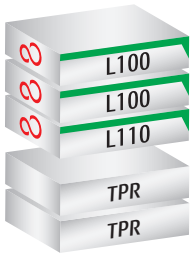
Based on the number of ROADM degrees and L100 blades required, there can be up to 128 add/drop channels at 100 Gbps or higher in a small ROADM node. The L100 can support up to 96 C-band 50 GHz fixed channels or 128 flex-grid channels per ROADM degree. The current maximum capacity is 25.6 Tbps (200 Gbps × 128 channels) per degree.

SDN Management and Control

1FINITY L100 series blades are supported by the Fujitsu Virtuora® software suite, including Virtuora Planning and Design, Virtuora Network Management and Virtuora NC (network controller).



Deg	# of A/D
1	96
2	128
3	112
4	96



Up to 4-Degree CD ROADM Node

Lambda blades:

- L100: One ROADM-on-a-blade per degree
- L110: One or more dual 4 × 16 channel add/drop management blades

Capabilities:

- Up to 4-degree support
- Up to 128 clients

Up to 4-degree CD-ROADM node configuration with transponders (TPR)

Technical Specifications

Base System	
System Configuration	1RU ROADM-on-a-blade with twin WSS
Local Management Port (LMP)	1 ×10/100 Mbps Ethernet RJ-45
Management Port (LCN)	4 × GbE SFP (T, SX, LX, EX, ZX)
Front LEDs	System Status, Severity, Port
Fans	3 replaceable fans
Power Supply	Dual-feed, fixed DC power supply
Software OS	Linux
Line Interface	
Line Ports per Blade	1 Network, 1 OSC
Line Rates	100 Gbps, 200 Gbps, Future 400 Gbps
Tx Wavelength	1528.77–1566.72 nm
Rx Wavelength	1528.77–1566.72 nm
Performance Monitoring	
Service PMs	24-hour, 15-min
Thresholds and TCA	Support (user assignable)
Management	
Virtuora NC	Yes
Web GUI	Yes
CLI	Yes
NETCONF / YANG	Yes
SNMP	SNMP v2, v3
Communications	SSH, SFTP, FTP, Telnet, HTTP, HTTPS
Timing	NTP
In Band Mgmt	OSC (1511 nm)
OSMINE Support	CLEI
Physical Characteristics	
Blade Physical Dimensions (H × W × D)	1.75" × 19" × 17.72" (44.45 × 483 × 450 mm) W = 19" or 23" with mounting rails D < 23.6" (600 mm) with fiber management
Rack Compatibility	19" and 23", 2- and 4-post
Supported in Housing	Yes
Weight	Blade: 17.857 lbs (8.10 kg)

Operating Environment	
Operating Temperature	+5 to +40 °C
Operating Humidity	5% to 85%
Power	
Power Supply	Dual-feed, fixed DC power supply
120 V AC	No
-48 V DC	-40V DC to -57V DC
Power Consumption	180 W
Regulatory and Compliance	
FCC	FCC Part 15, Class A
NEBS	NEBS Level 3
UL/CSA	UL/CSA 60950-1
CE	CE
RoHS	RoHS
CISPR	CISPR 24, CISPR 32
ETSI	EN 300-019, EN 300-132, EN 300-753, EN 300-386
WEEE	WEEE
RCM	RCM
CDRH	FDA CDRH
ROADM Capacity and Functions	
Configuration	• Colorless, Directionless (CD) ROADM • Colorless 8-channel ROADM option
ROADM degrees	• Up to 4 degrees with L110 • 4–8 degrees with L110 and L120
Topology	Point-to-point, linear, ring, mesh
Wavelengths	100G, 200G, future 400G and above
Wavelengths Range	1528.77–1566.72 nm
Maximum Number of Channels per Degree	96 (50 GHz ITU-T fixed grid) 128 (37.5 GHz flex-grid)
Maximum System Capacity	25.6 Tbps (200G × 128 channels) per degree
Span Loss	0–35 dB
Optical Supervisory Channel (OSC)	OC-3, 100 Mbps Ethernet, GbE

LASER SAFETY CLASSIFICATION & CAUTION
The 1FINITY L100 and L110 are compliant with the Laser IEC/EN 60825-1, -2 standards

CLASS 1M CAUTION
Invisble laser radiation
Do not view directly with optical instruments
Class 1M laser product

HAZARD LEVEL 1M CAUTION
Hazard level 1m laser radiation
Do not view directly with non-attenuating optical instruments

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